Assam University, Silchar

Four Year Undergraduate Programme

Implemented under NEP 2020

Effective from the Academic Year 2023-24

Syllabus of Bachelor of Vocation (B. Voc.)

Information Technology

(3rd Year)

Approved in the 99th meeting of the Academic Council on 22.05.2025 vide Resolution No AC:99:05-25:5

Programme Specific Outcome

On successful completion of the FYUG B.Voc. (Information Technology) Programme, students will be able to:

1. Acquire various skills in the field of Information Technology. This includes skills related to various office automation tools like MS Office, PowerPoint, MS Excel, etc., and their applications.
2. Gain knowledge about the fundamentals of computer systems and their working. Further students will be able to develop programming skills with programming languages C, JAVA, Python, etc. by actually designing programs in concerned laboratories.
3. Learn about digital electronics, computer networking, operating systems, and related areas both theoretically and with practice by performing rigorous experiments in the laboratories.
4. Design, develop, and implement data structures and algorithms for problem-solving in various domains by virtue of training in the laboratories.
5. Learn scripting and web development tools like PHP, JavaScript, etc., and apply these to design and develop real-world tools.
6. Equip themselves with the knowledge of financial accountancy and develop expertise in software like Tally.
7. Get exposure to the modern concepts of computing like Artificial Intelligence, Cyber Security, Animation, E-Commerce, and various Internet Technologies as part of this Programme.
8. Get training in soft skills, languages, and management through various allied courses.
9. Get industrial exposure in the field of information technology through an internship with industry.
10. Seek employment in various jobs in the Government sector as well as IT and related industries and perform various roles related to software development, testing, and maintenance.

Table 1: Semester wise list of B. Voc. (Information Technology) DSC Course

Semester	Course Code	Title of The Course	Credits	L-T-P
I	BVIT-DSC-101	Fundamentals of Computer Systems	2	2-0-0
	BVIT-DSC-102	Office Tools and Applications	2	2-0-0
II	BVIT-DSC-151	Computer Network	2	2-0-0
	BVIT-DSC-152	(A) Introduction to Digital Electronics	2	2-0-0
		(B) Digital Electronics Laboratory	2	0-0-4
III	BVIT-DSC-201	Data Structure	4	4-0-0
	BVIT-DSC-202	Database Management System	3	3-0-0
IV	BVIT-DSC-251	Java Programming	3	3-0-0
	BVIT-DSC-252	Operating System	3	3-0-0
	BVIT-DSC-253	Operating System Laboratory	4	0-0-8
V	BVIT-DSC-301	Java Script	2	2-0-0
	BVIT-DSC-302	Graphic Design and Applications	2	2-0-0
	BVIT-DSC-303	(A) Java Script Laboratory	2	0-0-4
		(B) Graphic Design and Application Laboratory	2	0-0-4
VI	BVIT-DSC-351	Web Development with PHP	3	3-0-0
	BVIT-DSC-352	Introduction to Artificial Intelligence Frameworks	2	2-0-0
	BVIT-DSC-353	Internet Technologies	3	3-0-0
	BVIT-DSC-354	(A) Web Development with PHP Laboratory	4	0-0-8
		(B) Artificial Intelligence Tools Laboratory	4	0-0-8
		(C) Project Work	4	0-0-8
VII	BVIT-DSC-401	(A) Digital Marketing	2	2-0-0
		(B) Digital Marketing Laboratory	3	0-0-6
	BVIT-DSC-402	(A) Animation and Visual Effects	2	2-0-0
		(B) Animation and Visual Effects Laboratory	3	0-0-6
	BVIT-DSC-403	Cyber Security	2	2-0-0
	BVIT-DSC-404	Mobile Application Development Laboratory	3	0-0-6
VIII	BVIT-DSC-451	Design and Analysis of Computer Algorithms	4	4-0-0

Table 2: Semester wise list of B. Voc. (Information Technology) DSM Course

Semester	Subject	Course Code	Title of The Course	Credits	L-T-P
I	BVOC-DSM-1	BVIT-DSM-101	(A) Programming Skills using C	2	2-0-0
			(B) Programming Skills using C Laboratory	3	0-0-6
II	BVOC-DSM-2	BVIT-DSM-151	Computer Network Laboratory	3	0-0-6
III	BVOC-DSM-1	BVIT-DSM-201	Database Management System Laboratory	4	0-0-8
IV	BVOC-DSM-1	BVIT-DSM-251	Java Programming Laboratory	4	0-0-8
	BVOC-DSM-2	BVIT-DSM-252	(A) E-Commerce	2	2-0-0
			(B) E-CommerceLaboratory	2	0-0-4
V	BVOC-DSM-1	BVIT-DSM-301	(A) Python Programming	2	2-0-0
			(B) Python Programming Laboratory	4	0-0-8
	BVOC-DSM-2	BVIT-DSM-302	(A) Financial Accounting and Tally	2	2-0-0
			(B) Financial Accounting and Tally Laboratory	2	0-0-4
VI	BVOC-DSM-2	BVIT-DSM-351	Internet Technologies Laboratory	4	0-0-8
VII	BVOC-DSM-1	BVIT-DSM-401	(A) Software Engineering	2	2-0-0
			(B) Software Engineering Laboratory	3	0-0-6
VIII	BVOC-DSM-2	BVIT-DSM-451	Multimedia	4	4-0-0

Table 3: Semester wise list of B. Voc. (Information Technology) SEC Course

Semester	Course Code	Title of The Course	Credits	L-T-P
I	BVIT-SEC-101	Office Tools and Applications Laboratory	3	0-0-6
II	BVIT-SEC-151	OS Installation, Internet, hardware Assembling Laboratory	3	0-0-6
III	BVIT-SEC-201	Data Structure Laboratory	4	0-0-8
IV	-	-	-	
V	**BVIT-SEC-301**	Internship with Industry/ Community Engagement/ Field Study	2	0-0-4
VI	-	-	-	
VII	-	-	-	
VIII	**BVIT-SEC-451**	Project	12	0-0-24

Table 4: Semester wise list of B. Voc. (Information Technology) IDC Course

Semester	Course Code	Title of The Course	Credits	L-T-P
I	BVIT-IDC-101	Fundamentals of Information Technology	3	3-0-0
II	BVIT-IDC-151	Introduction to Web Technology	3	3-0-0
III	BVIT-IDC-201	Cyber Security	3	3-0-0

* NOTE:

➢ Mathematics maybe chosen as an IDC paper

➢ Evaluation method and marks distribution for combined paper i.e. Theory +Practical shall be as follows:

Theory: End Semester Examination - 35 Marks, Internal Test - 15 Marks Practical:

End Semester Examination - 35 Marks, Internal Test - 15 Marks

➢ For 2 credit paper, marks distribution shall be as follows:

End Semester Examination - 35 Marks, Internal Test - 15 Marks

➢ For papers of 35 and 50 marks, the end semester examination shall be of 2 hoursduration.

Syllabi of B. Voc. (Information Technology) DSC Courses

Semester	:	**V**
Course Type	:	**DSC**
Course Code	:	**BVIT-DSC-301**
Name of the Course	:	**Java Script**
Learning level	:	**Higher-level Course**
Credits	:	**2**
Contact Hours	:	**2 Hours per week**
Total Marks	:	**50**
End Semester Marks	:	**35 (Pass Marks: 14)**
Internal Marks	:	**15 (Pass Marks: 6)**
End Semester Exam Time	:	**2 hours**

Course Objectives: *The course objective is to*

1. Introduction of Java Script, jQuery and Ajax.
2. Explain the fundamentals of Java Scripts,
3. Explain the basic properties of JavaScript in html file
4. Explain dynamic web page using JavaScript and jQuery
5. Develop skills in students that can help them to develop dynamic web pages effectively using java script, jQuery and Ajax.

UNIT I

Introduction: Java Script definition, Essential features of java script, Lexical Structure, Data Types and Values-Numbers, Strings, Boolean Values, Objects, Arrays, Functions.

UNIT II

Variables: Variable type, Variable Declaration, Variable Scope, Basic Expression and operators, Conditional Statements- if statement, if-else statement, while statement, for statement, switch statement, break and continue statement.

UNIT III

Creating Objects: object properties, checking property existence, deleting properties, Arrays- reading and writing array elements, adding and deleting array elements, iterating through arrays, Functions- creating functions in Java Script, Declaring a function, designing a simple function.

UNIT IV

Adding Interactivity to a web page: basic event handling, mouse events and keyboard events in java script; Introduction to jQuery- Definition, advantages, adding jQuery to a page, selectors in jQuery, jQuery filters, add content to a page, setting and reading tag attributes, reading and removing html attributes.

Course Outcomes: *Upon successful completion of the course, the students will be able to*

1. *Apply the basics of Java Script in Web Designing.*
2. *Use basic properties of JavaScript in html file*
3. *Use jQuery in html file*
4. *Apply the implementation of Java script properties*
5. *Create dynamic HTML web pages using java script and jQuery*
6. *Design and develop the web applications using HTML and Java Scripts.*

Text Books:

1. **JavaScript & jQuery: The Missing Manual**, by David Sawyer McFarland, O'Reilly Media, Inc. (3rd Edition, 2014).
2. **JavaScript: The Definitive Guide,** by David Flanagan, O'Reilly Media, Inc. (7th Edition, 2020).
3. **Ajax: The Complete Reference**, Paperback by Thomas Powell (Author) McGraw Hill Education (2008)

Reference Books:

1. **Web Technologies: HTML, JAVASCRIPT, PHP, JAVA, JSP, ASP.NET, XML and Ajax, Black Book: HTML, Javascript, PHP, Java, Jsp, XML and Ajax, Black Book by Kogent Learning Solutions Inc.** (Author) Dreamtech Press; 1st edition (1 January 2009)
2. **Mastering HTML, CSS & JavaScript Web Publishing - Covers HTMLS5, CSS3, jQuery by Laura Lemay** (Author) BPB PUBLICATIONs(2022)
3. **JavaScript and jQuery: Interactive Front-End Web Development** by Jon Duckett, John Wiley & Sons (2014).

Semester	:	**V**
Course Type	:	**DSC**
Course Code	:	**BVIT-DSC-302**
Name of the Course	:	**Graphic Design and Applications**
Learning level	:	**Higher-level Course**
Credits	:	**2**
Contact Hours	:	**2 Hours per week**
Total Marks	:	**50**
End Semester Marks	:	**35 (Pass Marks: 14)**
Internal Marks	:	**15 (Pass Marks: 6)**
End Semester Exam Time	:	**2 hours**

Course Objectives: *The course objective is to*

1. *Learn the foundations of Graphic design and its applications.*
2. *Equip students with the technical knowledge and skills about Adobe Photoshop, CorelDraw and Adobe Illustrator.*
3. *Develop skills in students that can help them to convey messages effectively through design.*
4. *Expose students to industry-standard tools like Adobe Photoshop, Illustrator, CorelDraw for digital and print design*
5. *Expose students to solve visual communication challenges effectively through design thinking and creativity.*

UNIT I

Introduction: Graphic design concept, Types of graphics, uses of graphics, software used for graphics designing, Application of Graphics: Presentation Graphics, Computer Art, Entertainment, Education and Training, Visualization, Image Processing, Graphical User Interface, Raster-Scan and Random-Scan graphics.

UNIT II

Introduction: Photoshop Interface, Raster graphics & vector graphics, Image formats, Operations on image. **Manipulation of Image:** The marquee tool, the lasso tool, magic Wand tool, Inverting Selection, Layers, Brush tool, Eraser tool, Fill tool, Blur tool, Smudge tool, Sharpen tool, Dodge tool, Sponge tool, Darken tool.

Transformation & Retouching: Free transform, Scaling, rotation, Skew, perspective, Wrap, Distort, Crop, Image size, Canvas size, Clone stamp tool, Healing brush tool, patch tool, red eye tool, history brush tool.

UNIT III

Colour Correction: Colour swatch, image modes, color adjustments, color selection. **Text:** The text tool, editing text, formatting, line & spacing, wrap text, text effects. **Effects:** Blending modes, styles, filters, liquefy, Vanishing point. **Drawing**: The pen tool, drawing shapes, managing paths, converting path to selection

UNIT IV

CorelDraw Introduction: An overview, interface, menus and tools, working with new document, advanced options, page setup. **Drawing:** Lines, Shapes, objects, tables, templates **Import/Export**: Importing files, Using Corel Connect, Exporting files. **Manipulation:** Viewing options, pick tool, selection, moving, sizing, mirroring, rotating, skewing, undo, redo, staking order. **Text:** Artistic text, Paragraph text.

UNIT V

CorelDraw Duplication & Alignment: understanding duplication, aligning objects, distribution, spacing. **CorelDraw Colour:** colouring objects, uniform fill, fountain fill, understanding colour palette, interactive fill, eyedropper tool, outline, convert to curve, outline properties, advanced outline options.
Introduction to Adobe Illustrator: Workspace basics, Customizing the workspace, Artboard overview, Files and templates, Recovery, Drawing simple lines and shapes, Drawing with the Pen, Pencil, or Flare tool

Course Learning Outcomes: *After successful completion of the course, the students will be able to*

1. *Understand the graphic design and its applications.*
2. *Develop a deeper understanding and familiarity with various types of graphic design software such as Adobe Photoshop, Illustrator, CorelDraw*
3. *Gain proficiency in industry-standard tools like Adobe Photoshop, Illustrator, CorelDraw for digital and print design.*
4. *Develop logos, brand identities, and marketing materials for businesses and organizations.*
5. *Develop a strong portfolio showcasing various design projects to prepare for careers in graphic design.*

Text Books:

1. **Computer Graphics** by Donald Hearn and M. Pauline Baker, Prentice-Hall of India Pvt. Limited (2nd Edition, 2007) .
2. **Mastering Adobe Photoshop Elements** by Robin Nichols, Packt Publishing (Illustrated Edition, 2019)
3. **Adobe Photoshop CC/ CS 6**, Computect Publications Limited, Asian Publisher (3rd Edition, 2021).
4. **Learn Adobe Illustrator CC for Graphic Design and Illustration** by Chad Chelius and Rob Schwartz, Pearson education (2nd Edition, 2020).
5. **Graphic Design the New Basics** by Ellen Lupton and Jennifer Cole Phillips, Princeton Architectural press (2nd Edition, 2015)
6. **Teach Yourself CorelDraw** by Niranjan Jha Showman, Notion Press (2022).

Reference Books:

4. **Adobe after Effects Classroom in a Book 2024 release: the Official Training workbook from Adobe,** Adobe Pr (1st Edition, 2024).
5. **Adobe Photoshop** by Bittu Kumar, V &S Publisher (Revised Edition, 2013).
6. **CorelDraw training Guide** by Prof. Satish Jain and M. Geetha, BPB, (1st Edition, 2018).
7. **CorelDraw 2023- Training book with many Exercises** by Peter Schiessl, Lindemann Group (2023).
8. **Adobe Illustrator CC Classroom in a Book** by Brian Wood, Pearson Education (1st Edition, 2018).

Semester	**:**	**V**
Course Type	**:**	**DSC**
Course Code	**:**	**BVIT-DSC-303 (A)**
Name of the Course	**:**	**Java Script Laboratory**
Learning level	**:**	**Higher-level Course**
Credits	**:**	**2**
Contact Hours	**:**	**4 Hours per week**
Total Marks	**:**	**50**
End Semester Marks	**:**	**35 (Pass Marks: 14)**
Internal Marks	**:**	**15 (Pass Marks: 6)**
End Semester Exam Time	**:**	**2 hours**

Course Objectives: *The course objective is to*

1. Familiarize students with javascript, jQuery and Ajax
2. Provide the practical knowledge of scripting language
3. Prepare students to develop dynamic web pages using java script, jQuery and Ajax

Following are some programming tasks for laboratory programming assignments but the assignments are not limited to these only.

1. Create two variables, a and b, assign them numbers, and print their sum.
2. Write a program to find the length of a string stored in a variable str.
3. Write a program to calculate the area of a rectangle given length and width.
4. Write a program to convert temperature from Celsius to Fahrenheit.
5. Create a function to find the maximum of three numbers.
6. Write a JavaScript program to compare two objects to determine if the first contains equivalent property values to the second one.
7. Write a JavaScript program to convert a specified number into an array of digits.
8. Write a JavaScript program to filter out the specified values from a specified array. Return the original array without filtered values.
9. Write a JavaScript program to remove specified elements from the left of a given array of elements.
10. Write a JavaScript program to remove specified elements from the right of a given array of elements.
11. Write a JavaScript function that checks whether a passed string is a palindrome or not?
12. Write a JavaScript function that returns a string that has letters in alphabetical order.
    Example string : 'webmaster'
    Expected Output : 'abeemrstw'
    Assume punctuation and numbers symbols are not included in the passed string.
13. Write a JavaScript program that computes the average marks of the following students. Then, this average is used to determine the corresponding grade.

Student Name	Marks
David	80
Vinoth	77
Divya	88
Ishitha	95
Thomas	68

The grades are computed as follows:

Range	Grade
<60	F
<70	D
<80	C
<90	B
<100	A

14. Write a JavaScript program that creates a button and add a click event listener to log a message when it's clicked.
15. Write a JavaScript function that changes the background color of an element when a mouse enters it.
16. HTML form that accepts a student name and roll no Use JavaScript function to perform following validation
    (a) JavaScript program to validate a date
    (b) Create a paragraph element with some text and append it to the end of the document body using jQuery.
    (c) Using jQuery count every element (including head, body, etc.) in the document.
    (d) Creating personal website using html, css, jQuery and javascript

Course Outcomes: *Upon successful completion of the course, the students will be able to:*

1. *Create dynamic HTML web pages using java script and jQuery*
2. *Use jQuery in html file and*
3. *Design and develop the web applications using HTML and Java Scripts.*

Semester	:	**V**
Course Type	:	**DSC**
Course Code	:	**BVIT-DSC-303 (B)**
Name of the Course	:	**Graphic Design and Applications Laboratory**
Learning level	:	**Higher-level Course**
Credits	:	**2**
Contact Hours	:	**4 Hours per week**
Total Marks	:	**50**
End Semester Marks	:	**35 (Pass Marks: 14)**
Internal Marks	:	**15 (Pass Marks: 6)**
End Semester Exam Time	:	**2 hours**

Course Objectives: *The course objective is to*

1. *Equip students with the technical knowledge and skills about Adobe Photoshop, CorelDraw and Adobe Illustrator.*
2. *Expose students to industry-standard tools like Adobe Photoshop, Illustrator, CorelDraw for digital and print design*
3. *Expose students to solve visual communication challenges effectively through design thinking and creativity.*

Following are some programming tasks for laboratory programming assignments but the assignments are not limited to these only.

1. Perform the following in Adobe Photoshop
    a. Crop a image
    b. Background removal
    c. Export and save the design
2. Combine image with layer mask
3. Include vector graphics
4. Add text and effects to an image
5. Create an image for Social media using Adobe Photoshop
6. Create a web banner using Adobe Photoshop
7. Photo editing and retouching
8. Digital painting in Photoshop
9. Crafting a cartoon effect
10. Building a graphic design portfolio
11. Create graphics using various tools like shapes, text, effects, and clip art using coralDraw and save the completed files.
12. Insert special characters within text using CorelDraw
13. Design a title page for a book using CorelDraw
14. Design a business card using CorelDraw
15. Use the Pen tool to create a vector image based on a bitmap image in Adobe Illustrator.
16. Create Pen tool curves as well as straight lines to mimic the shapes in the original image in Adobe Illustrator
17. Creating A Document & Understanding Artboards
18. Drawing shapes with different angle in Adobe Illustrator
19. Convert hand drawn sketch on paper to an editable shape in illustrator
20. Saving and exporting in Adobe Illustrator

Course Learning Outcomes: *After successful completion of the course, the students will be able to:*

1. *Develop brand identities, and marketing materials for businesses and organizations*
2. *Gain proficiency in industry-standard tools like Adobe Photoshop, Illustrator, CorelDraw for digital and print design.*
3. *Develop a strong portfolio showcasing various design projects to prepare for careers in graphic design.*

Semester	:	**VI**
Course Type	:	**DSC**
Course Code	:	**BVIT-DSC-351**
Name of the Course	:	**Web Development with PHP**
Learning level	:	**Higher-level Course**
Credits	:	**3**
Contact Hours	:	**3 Hours per week**
Total Marks	:	**100**
End Semester Marks	:	**70 (Pass Marks: 28)**
Internal Marks	:	**30 (Pass Marks: 12)**
End Semester Exam Time	:	**3 hours**

Course Objectives: *The course objective is to*

1. *Equip student with fundamentals knowledge of PHP, including operators, control structures, and data handling.*
2. *Expose students to Object-Oriented Programming concepts in PHP.*
3. *Learn database connectivity in PHP to solve real world problems*

UNIT-I

PHP Introduction, PHP Install, Syntax, Variables and Data Types, Strings, Constants, Operators, Loops and Switch, Handling Html Form with PHP

UNIT-II

Function: Call by value and Call by reference, Recursive function, Creating and accessing String. Searching& Replacing String, Formatting String, String Related Library function.

UNIT-III

Array: Creating index based and Associative array, Looping with Index based array, Looping with associative array, Library function for Array, Handling Html Form with Php

UNIT-IV

Cookies and Session: Setting Cookies with PHP, Using Cookies with Sessions, Deleting Cookies, Registering Session variables, Destroying the variables and Session.

Understanding file& directory- Opening and closing, a file, Copying, renaming and deleting a file, working with directories, Creating and deleting folder,

UNIT-V

Introduction to RDBMS: Connection with MySQL Database, Performing basic database operation (Insert, delete, update, select) State Management- Using query string (URL rewriting). Exception Handling Understanding Exception and error, Try, catch, throw. Error tracking and debugging.

Course Learning Outcomes: *After successful completion of the course, the students will be able to*

1. *Gain proficiency in using MySQL to build dynamic, data-driven web applications.*
2. *Handle HTML forms and validate user data before storing it in a database using PHP.*
3. *Develop a real world application programs based on Database.*

Text Books:

1. VIKRAM VASWANI, "**PHP and MySQL**", Tata McGraw-Hill, 2005
2. BEN FORTA, "**MySQL Crash course**" SAMS, 2006.
3. C.J. DATE, "**An introduction to Database Systems**", Addison Wesley, 6th Edition.
4. Ramesh Elmasri and Shamkant B Navathe," **Fundamentals of DataBase Systems**", Pearson Education, 3rd Edition.

Reference Books:

1. Tim Converse, Joyce Park and Clark Morgan, "**PHP 5 and MySQL**", Wiley India reprint, 2008.
2. Robert Sheldon, Geoff Moes, "**Beginning MySQL**", Wrox, 2005.
3. Alexis Leon and Mathews Leon, "**Database Management Systems**", Vikas, 2008.

Semester	**:**	**VI**
Course Type	**:**	**DSC**
Course Code	**:**	**BVIT-DSC-352**
Name of the Course	**:**	**Introduction to Artificial Intelligence Frameworks**
Learning level	**:**	**Higher-level Course**
Credits	**:**	**2**
Contact Hours	**:**	**2 Hours per week**
Total Marks	**:**	**50**
End Semester Marks	**:**	**35 (Pass Marks: 14)**
Internal Marks	**:**	**15 (Pass Marks: 6)**
End Semester Exam Time	**:**	**2 hours**

Course Objectives: *The course objective is to*

1. *Introduce classical AI, problem formulation and intelligent agents.*
2. *Introduce techniques for problem solving by search, knowledge-representation and reasoning.*
3. *Introduce AI Applications, planning, and multi-agent systems.*

UNIT-I

Introduction–Definition – Future of Artificial Intelligence – Characteristics of Intelligent Agents–Typical Intelligent Agents – Problem Solving Approach to Typical AI problems.

UNIT-II

Problem solving Methods – Search Strategies- Uninformed – Informed – Heuristics – Local Search Algorithms and Optimization Problems -Searching with Partial Observations – Constraint Satisfaction Problems – Constraint Propagation – Backtracking Search.

UNIT-III

Knowledge Representation First Order Predicate Logic – Prolog Programming – Unification – Forward Chaining-Backward Chaining – Resolution – Knowledge Representation – Ontological Engineering-Categories and Objects.

UNIT-IV

Software Agents Architecture for Intelligent Agents – Agent communication – Negotiation and Bargaining – Argumentation among Agents – Trust and Reputation in Multi-agent systems.

UNIT-V

Applications AI applications – Language Models – Information Retrieval- Information Extraction – Natural Language Processing – Machine Translation – Speech Recognition – Robot – Hardware –Perception – Planning – Moving

Course Learning Outcomes: *After successful completion of the course, the students will be able to*

1. *Understand the foundations of AI systems, intelligent agents, problems solving strategies and Ethics in AI.*
2. *Apply elementary principles of AI like search and game playing for problem solving.*
3. *Analyse real world problems under uncertainty and solve them using knowledge representation and reasoning.*
4. *Understand planning and decision making in intelligent systems.*

Text Books:

1. S. Russell and P. Norvig, "**Artificial Intelligence: A Modern Approach**", Prentice Hall, 3rd Edition, 2009.

2. Stuart Russell, peter Norvig, “**Artificial Intelligence: A Modern Approach**”, 4^{th} Edition, Pearson education, 2020.
3. I. Bratko, “**Prolog: Programming for Artificial Intelligence**”, 4^{th} Edition, Addison-Wesley Educational Publishers Inc., 2011.

Reference Books:

1. M. Tim Jones, “**Artificial Intelligence: A Systems Approach (Computer Science)**”, Jones and Bartlett Publishers, Inc.; First Edition, 2008.
2. Nils J. Nilsson, “**The Quest for Artificial Intelligence**”, Cambridge University Press, 2009.
3. William F. Clocksin and Christopher S. Mellish, “**Programming in Prolog: Using the ISO Standard**”, 5^{th} Edition, Springer, 2003
4. Gerhard Weiss, “**Multi Agent Systems**”, 2^{nd} Edition, MIT Press, 2013
5. David L. Poole and Alan K. Mackworth, “**Artificial Intelligence: Foundations of Computational Agents**”, Cambridge University Press, 2010.

Semester	:	**VI**
Course Type	:	**DSC**
Course Code	:	**BVIT-DSC-353**
Name of the Course	:	**Internet Technologies**
Learning level	:	**Higher-level Course**
Credits	:	**3**
Contact Hours	:	**3 Hours per week**
Total Marks	:	**100**
End Semester Marks	:	**70 (Pass Marks: 28)**
Internal Marks	:	**30 (Pass Marks: 12)**
End Semester Exam Time	:	**3 hours**

Course Objectives: *The course objective is to*

1. *Provide conceptual and technological developments in the field of Internet and web designing*
2. *Provide comprehensive knowledge of Internet, its applications and the TCP/IP protocols.*
3. *Introduce basic concepts of web design.*

UNIT-I

Introduction to internet: Internet- Growth of Internet and ARPANet - Owners of the Internet -Anatomy of Internet – History of WWW - Basic Internet Terminologies – Net etiquette - Internet Applications - Commerce on the Internet Governance on the Internet - Impact of Internet on Society.TCP/IP Internet Technology and Protocols: Packet Switching Technology - Internet Protocols - TCP/IP – Router - Internet Addressing Scheme-Machine Addressing - E-mail Addresses – Resource Addresses

UNIT-II

Interconnectivity: Connectivity types - Setting up a connection - Hardware requirements- Selection of a modem - Software requirements – Internet accounts by ISP-ISDN-Protocol options-Service options. Internet Network: Network DefinitionCommon terminologies – Node - Host- Workstation -Network Administrator - Network security - Network Components – Servers-client Server- Communication Media - Types of Networks - Addressing in Internet – DNS - Network topologies – Ethernet – FDDI - ATM.

UNIT-III

Browsers and Search engines: Browsers - What is a browser? – Parts of a browser window-Running a browser - working with a Browser. Search engines: What is search engine? - Types of search engines - Search and meta search engines.

UNIT-IV

E-mail: E-mail - E-mail Networks and Servers - E-mail Protocols - Structure of Email - Attachments – E-mail Clients - E-mail Clients - web based E-mail- Address book – Signature File.

UNIT-IV

HTML Programming Basics: Introduction to HTML – HTML browsers - Different versions of HTML-HTML tags - Document overview - Header elements - Section headings - Block headings - Lists-Inline elements – Images - working with Tables, Forms, Frames.

Course Learning Outcomes: *After successful completion of the course, the students will be able to*

1. *Describe the basic concepts of Web and Internet technologies*
2. *Learn the basic working scheme of the Internet and World Wide Web.*
3. *Understand fundamental tools and technologies for web design.*
4. *Comprehend the technologies for Hypertext Mark-up Language (HTML).*
5. *Design a web pages and sites using HTML*
6. *Effectively deal with programming issues relating to HTML*

Text book:

1. **Internet Technology and Web design**, Ramesh Bangia, Firewall Media, (An imprint of Lakshmi Publications Pvt. Ltd.), 3rd Edition, 2011.

Reference Books:

1. **The Internet Book**, Douglas E. Comer, Fourth Edition, PHI Learning Pvt. Ltd. , New Delhi, 2009.
2. **Using the Internet the Easy Way**, Young Kai Seng, Minerva Publications, First Edition, 2000.
3. **Fundamentals of Information Technology** by Alexis Leon and Mathews sLeon, Vikas Publishing House Pvt. Ltd., Revised Edition.

Semester	**:**	**VI**
Course Type	**:**	**DSC**
Course Code	**:**	**BVIT-DSC-354 (A)**
Name of the Course	**:**	**Web Development with PHP Laboratory**
Learning level	**:**	**Higher-level Course**
Credits	**:**	**4**
Contact Hours	**:**	**8 Hours per week**
Total Marks	**:**	**100**
End Semester Marks	**:**	**70 (Pass Marks: 28)**
Internal Marks	**:**	**30 (Pass Marks: 12)**
End Semester Exam Time	**:**	**3 hours**

Course Objectives: *The course objective is to*

1. *Equip student with practical knowledge of PHP, including operators, control structures, and data handling.*
2. *Understand the features like functions, forms in PHP*
3. *Understand Cookies, Sessions and Data base.*

Following are some programming tasks for laboratory programming assignments but the assignments are not limited to these only.

1. Get name of the user from a form and show greeting text.
2. Write a php program to check whether given number is palindrome or not.
3. Write a php program to check whether given number is Armstrong or not.
4. Write a php program to find largest values of two numbers using nesting of function.
5. Write a Mathematical calculator program.
6. Write a Age calculator program.
7. Write a PHP program to check whether given number is String palindrome or not.
8. Write a PHP program using function.

9. Create a PHP page for login page without sql connection.
10. Write a PHP program to Array manipulation.
11. Write a PHP program to design personal information
12. Create a PHP page for login page with sql connection.
13. Write a PHP program to Read from existing file.
14. Write a PHP program to Write a file
15. Write a PHP program to calculate Date and Time function.
16. Write a PHP program to design Curriculum Vitae.
17. Write a PHP program hit counter using cookies.
18. Create a web page to advertise a product of the company using images and audio.
19. Create a web page for software company websites.
20. Create a PHP page for login system using session.

Course Learning Outcomes: *After successful completion of the course, the students will be able to*

1. *Utilize the basic concept of statements and arrays.*
2. *Implement functions and browser handling power of PHP.*
3. *Impart Database applications, File Handling, Cookies in the webpage.*
4. *Design and Implement Interactive Web Site using Forms*

Semester	:	**VI**
Course Type	:	**DSC**
Course Code	:	**BVIT-DSC-354 (B)**
Name of the Course	:	**Artificial Intelligence Tools Laboratory**
Learning level	:	**Higher-level Course**
Credits	:	**4**
Contact Hours	:	**8 Hours per week**
Total Marks	:	**100**
End Semester Marks	:	**70 (Pass Marks: 28)**
Internal Marks	:	**30 (Pass Marks: 12)**
End Semester Exam Time	:	**3 hours**

Course Objectives: *The course objective is to*

1. *Apply artificial intelligence theory and concepts to analyze the requirements, realize technical specifications, and design engineering solutions.*
2. *Design solutions for complex engineering problems*

Following are some programming tasks for laboratory programming assignments but the assignments are not limited to these only.

1. Introduction of various python libraries used for machine learning.
2. Write a Program to implement Uninformed Search Technique: Breadth First Search.
3. Write a Program to implement Uninformed Search Technique: Depth First Search.
4. Write a Program to implement Informed Search Technique: A* Algorithm.
5. Write a Program to implement Informed Search Technique: AO* Algorithm.
6. Write a Program to implement Local Search Technique: Hill Climbing Algorithm.
7. Write a Program to implement Game Playing Algorithms: Minimax and Alpha Beta Pruning.
8. Write a Program to create a Chatbot in Python.
9. Program to Implement N-Queens Problem using Python.
10. Program to Implement Missionaries Cannibals Problems using Python.

Course Learning Outcomes: *After successful completion of the course, the students will be able to*

1. *Apply the knowledge gained pertaining to data storage, data analytics and AI concepts to solve real world business problems.*

2. *Able to evaluate and apply knowledge of data engineering, artificial intelligence, machine learning, and human cognition to real-world issues in order to solve potential challenges.*
3. *Able to acquire computational knowledge and project development abilities using novel tools and methodologies to tackle challenges in the fields related to Machine learning and Artificial Intelligence.*

Semester	**:**	**VI**
Course Type	**:**	**DSC**
Course Code	**:**	**BVIT-DSC-354 (C)**
Name of the Course	**:**	**Project Work**
Learning level	**:**	**Higher-level Course**
Credits	**:**	**4**
Contact Hours	**:**	**8 Hours per week**
Total Marks	**:**	**100**
End Semester Marks	**:**	**70 (Pass Marks: 28)**
Internal Marks	**:**	**30 (Pass Marks: 12)**
End Semester Exam Time	**:**	**3 hours**

The Department will offer a "Project Work" for the students under allocated Project Supervisors as per the existing rules of Assam University, Silchar. (AC Resolution: 99: 05-25:26.8)

Syllabi of B. Voc. (Information Technology) DSM Courses

Semester	**:**	**V**
Course Type	**:**	**DSM**
Course Code	**:**	**BVIT-DSM-301 (A)**
Name of the Course	**:**	**Python Programming**
Learning level	**:**	**Higher-level Course**
Credits	**:**	**2**
Contact Hours	**:**	**2 Hours per week**
Total Marks	**:**	**50**
End Semester Marks	**:**	**35 (Pass Marks: 14)**
Internal Marks	**:**	**15 (Pass Marks: 6)**
End Semester Exam Time	**:**	**2 hours**

Course Objectives: *The course objective is to*

1. *Familiarize students with the basics of Python programming language, including syntax, variables, data types, and control structures syntax, variables, data types, and control structures.*
2. *Introduce students to fundamental programming concepts such as variables, data types, operators, conditional statements, loops, and functions, within the context of Python.*
3. *Explore various data structures in Python, such as lists, tuples, dictionaries, and sets, and develop the skills to manipulate, access, and organize data using these structures.*
4. *Develop skills in handling errors and exceptions in Python programs, allowing for graceful error handling and robustness.*

UNIT-I

Introduction: Basic Elements of Python, Python character set, Python tokens (keyword, identifier, literal, operator, punctuator), variables, concept of l-value and r-value, use of comments, Data types: Number(integer, floating point, complex), Operators: arithmetic operators, relational operators, logical operators, assignment operators, augmented assignment operators, identity operators (is, is not), membership operators (in not in)

UNIT-II

Expressions, statement, type conversion, and input/output: precedence of operators, expression, and evaluation of an expression, type-conversion (explicit and implicit conversion), accepting data as input from the console and displaying output.

Flow of Control: introduction, use of indentation, sequential flow, conditional and iterative flow; Conditional statements: if, if-else, if-elif-else, flowcharts, simple programs: e.g.: absolute value, sort 3 numbers and divisibility of a number.

UNIT-III

Iterative Statement: for loop, range(), while loop, flowcharts, break and continue statements, nested loops, suggested programs: generating pattern, summation of series, finding the factorial of a positive number. Strings: introduction, string operations (concatenation, repetition, membership and slicing), traversing a string using loops, built-in functions/methods.

UNIT-IV

Python functions: types of functions, function definition, function call, types of function arguments, pas by value and pass by reference/object reference, recursion, advantages and disadvantages of recursion, scope and lifetime variables.

UNIT-V

Python Files: Python File Operation, Python Directory , Python Exception Handling, python built-in exception, Try, Except and Finally, Python user defined exception, Python graph plotting using Matplotlib.

Course Learning Outcomes: *After successful completion of the course, the students will be able to*

1. *Demonstrate a solid understanding of Python syntax, including variables, data types, control structures, functions, classes, and modules.*
2. *Develop problem-solving skills and the ability to design, implement, and debug Python programs to solve a variety of computational problems.*
3. *Demonstrate the ability to read from and write to files, process data from external sources, and handle input/output operations using Python.*

Text Books

1. . John V. Guttag, “**Introduction to Computation and Programming Using Python**”, 2nd Edition, PHI 2 Core, 2016
2. R. Nageswara Rao, “**Python Programming**”, dreamtech Press, 2nd Edition, 2018.

Reference Books

1. Ramsey Hamilton, **Python: Programming: A Beginner’s Guide**, Create space Independent Pub, 2nd Edition, 2016
2. YashavantKanetkar, “**Let Us Python**”, BPB Publications, 5th Edition, 2022
3. R.S. Salaria, “**Programming in Python**”, Khanna Publishing House, 2nd Edition, 2019.
4. P. Sharma, “**Programming in Python**”, BPB, 2nd Edition, 2014
5. T. Budd, “**Exploring Python**”, TMH, 1st Edition, 2011

Semester	:	**V**
Course Type	:	**DSM**
Course Code	:	**BVIT-DSM-301 (B)**
Name of the Course	:	**Python Programming Laboratory**
Learning level	:	**Higher-level Course**

Credits	:	**4**
Contact Hours	:	**8 Hours per week**
Total Marks	:	**100**
End Semester Marks	:	**70 (Pass Marks: 28)**
Internal Marks	:	**30 (Pass Marks: 12)**
End Semester Exam Time	:	**3 hours**

Course Objectives: *The course objective is to*

1. *Provide students with hands-on experience in writing Python code.*
2. *Allows practicing programming concepts, syntax, and techniques in a real-world coding environment.*
3. *Help students understand and apply fundamental programming concepts such as variables, data types, control structures (loops and conditionals), functions, and input/output operations in Python.*

Following are some programming tasks for laboratory programming assignments but the assignments are not limited to these only.

1. Using a loop, print a table of Celsius/Fahrenheit equivalences. Let c be the Celsius temperatures ranging from 0 to 100, for each value of c, print the corresponding Fahrenheit temperature.
2. Using a while loop, produce a table of sins, cosines and tangents. Make a variable x in range from 0 to 10 in steps of 0.2. For each value of x, print the value of sin(x), cos(x) and tan(x).
3. Write a program that reads an integer value and prints "leap year" or "not a leap year".
4. Write a function that takes an integer 'n' as input and calculates the value of
   $$1 + 1/1! + 1/2! + 1/3! + \ldots + 1/n$$
5. Write a function that takes an integer input and calculates the factorial of that number.
6. Write a function that takes a string input and checks if it's a palindrome or not.
7. Write a list function to convert a string into a list, as in list ('abc') gives [a, b, c].
8. Write a program to generate Fibonacci series.
9. Write a program to check whether the input number is even or odd.
10. Write a program to compare three numbers and print the largest one.
11. Write a program to print factors of a given number.
12. Write a method to calculate GCD of two numbers.
13. Write a program to sort a list using insertion sort and bubble sort and selection sort.
14. Problems related to File handling, exception handling in python, usage of user defined exceptions and assertions.
15. Problems related to string manipulations, basic operations, slicing.

Course outcomes: *After successful completion of the course, the students will be able to*

1. *Develop a strong foundation in Python programming language, including syntax, data types, control structures, functions, and file handling.*
2. *Analyze problems, design algorithms, and implement efficient solutions using Python.*
3. *Capable of developing small-scale applications using Python.*
4. *Develop skills in identifying and resolving errors in Python code. They should be proficient in using debugging tools and techniques to identify and fix issues, ensuring the correctness and reliability of their programs.*

Semester	:	**V**
Course Type	:	**DSM**
Course Code	:	**BVIT-DSM-302 (A)**
Name of the Course	:	**Financial Accounting and Tally**
Learning level	:	**Higher-level Course**
Credits	:	**2**

Contact Hours	:	**2 Hours per week**
Total Marks	:	**50**
End Semester Marks	:	**35 (Pass Marks: 14)**
Internal Marks	:	**15 (Pass Marks: 6)**
End Semester Exam Time	:	**2 hours**

Course Objectives: *The course objective is to*

1. *Help students to acquire conceptual knowledge of the financial accounting*
2. *Impart skills for recording various kinds of business transactions*
3. *Help students to acquire theoretical knowledge about tally software*

UNIT I

Introduction: Financial Accounting, Importance of financial Accounting, Accounting principles, concept and conventions, Introduction to accounting standards, Indian Accounting Standards (AS), International Financial Reporting Standards (IFRS)

UNIT II

Forms of business Organization, Types of Accounts, Role of Accounting, Double entry system of book keeping, **Mode of accounting, Financial Statements:** Trading Account, Profit and Loss Account and Balance sheet.**Computerization of accounts:** Role of Computers in Accounting, Advantages and limitations.

UNIT III

Journal –Steps in Journalizing, Advantages and limitations of Journalizing, Ledger - Posting into ledger – Balancing of accounts – Preparation of trial balance (Problems), Accounting Vouchers, types of Accounting Vouchers.

UNIT IV

Basic Accounting Ratios: Profitability, liquidity, turnover and solvency ratios, preparation of fund flow statement, cash flow statement and Ban Reconciliation statement.

UNIT V

Introduction to Tally: Company information, create, display alter, backup, restore, recovery of data, quit, gateway of tally, ledgers, ledger alteration, ledger display, budgets, groups, cost centers, voucher entry, voucher types.

Course outcomes: *After successful completion of the course, the students will be able to*

1. *Gain sound theoretical knowledge and apply the same in practice*
2. *Perform the ledger and voucher entries in Tally.*

Text Books

1. **Introduction to Financial Accounting**, by T. Horngren Charles (Author), L. Sundern Gary (Author), A. Elliott John (Author), R. Philbrick Danna (Author), Pearson Education (11th Edition, 2017).
2. **Financial Accounting- Concept and Applications** by J.R. MONGA (Author), Raj Bahadur (Author), Scholar tech press (2024)
3. **Tally Erp 9** by SHRADDHA SINGH (Author), V&S Publishers (2014)
4. **Comdex Tally.ERP 9 Course Kit** by Dr. Namrata Agrawal (Author), Dreamtech Press (2019)

Reference Books

1. **Financial and Management Accounting** by Maheshwari SN (Author), Maheshwari Suneel K (Author), Maheshwari Sharad K (Author), Sultan Chand and Sons (2022).
2. **Financial Accounting: Fundamentals, Analysis and Reporting** by R. K. Arora (Author), Wiley (2nd Edition, 2018).

3. **Tally Workbook** by Rakesh Sangwan (Author), Astha Publications (2nd Edition, 2020)

Semester	:	**V**
Course Type	:	**DSM**
Course Code	:	**BVIT-DSM-302 (B)**
Name of the Course	:	**Financial Accounting and Tally Laboratory**
Learning level	:	**Higher-level Course**
Credits	:	**2**
Contact Hours	:	**4 Hours per week**
Total Marks	:	**50**
End Semester Marks	:	**35 (Pass Marks: 14)**
Internal Marks	:	**15 (Pass Marks: 6)**
End Semester Exam Time	:	**2 hours**

Course Objectives: *The course objective is to*

1. *Help students to acquire conceptual knowledge of the financial accounting*
2. *Impart skills for recording various kinds of business transactions*
3. *Help students to acquire theoretical knowledge about tally software*

Following are some programming tasks for laboratory programming assignments but the assignments are not limited to these only.

1. Create a new company called Universal Business Solutions, Consultation Sole Proprietorship firm (Accounts Only)
2. Create a new company called Smart Agency, Mobile dealer of Mobile phones (Accounts with Inventory)
3. Open earlier company Universal Business Solutions and create following Ledgers in above Company

Ledger Name	**Under**
Nandini's Capital	Capital
Fixed deposit with HDFC	Investment in Fixed Deposit
Fixed deposit with ICICI	Investment in Fixed Deposit
Salary to staff	Indirect expenses
ICICI Bank	Bank Account
Computer	Fixed Assest

4. Open earlier company Smart Agency, Create following Groups in above Company

Group Name	under
Administrative Exp	Indirect Expenses
Selling and Distribution Exp	Indirect Expenses
Financial Exp	Indirect Expenses
Mumbai Customer	Sundry Debtors
Other customer	Sundry Debtors

5. Open earlier company Smart Agency, Create following in above Company

Stock Groups

Name	**Under**
Simple Phones	Primary

Smart Phones	Primary

Stock Categories

Name `	Under
Nokia	Primary
Samsung	Primary
Sony	Primary

Units of Measurement

Type	Symbol	Formal Name	Number of Decimal Places
Simple	Pcs	Pieces	0
Simple	Nos.	Numbers	0

Stock Items

Name	*Under*	*Unit of Measure*	*Stock Categories*
Samsung Grand 2	*Smart Phones*	*Nos.*	*Samsung*
Nokia 1210	*Simple Phones*	*Pcs*	*Nokia*
Sony Galaxy	*Smart Phones*	*Nos.*	*Sony*

6. Open company Universal Business Solutions, and Enter the following transactions:

Sl. No.	Date	Particulars
1	01/04/2024	Nandini Kapur started business by bringing cash of Rs. 5,00,000
2.	03/04/2024	Ms. Kapur opened a bank a/c with ICICI Bank for the firm by depositing cash Rs. 1,00,000
3	10/04/2024	Ms. Kapur opened Fixed deposit of Rs. 10,000 with ICICI bank by chq
4	15/04/2024	Ms. Kapur opened Fixed deposit of Rs. 15,000 with HDFC bank by chq
5.	21/04/2024	Purchased computer of Rs. 20,000 from Mr. Shree Enterprise on credit
6.	30/04/2024	Ms. Kapur paid salary for the month of April 2024 Rs. 12,000 in cash

7. Show the trial balance and balance sheet of the company
8. Show the profit and loss account of the company
9. Show the day book of the company

Course outcomes: *After successful completion of the course, the students will be able to*

1. *Gain sound theoretical knowledge and apply the same in practice*
2. *Perform the ledger and voucher entries in Tally.*

Semester	:	**VI**
Course Type	:	**DSM**
Course Code	:	**BVIT-DSM-351**
Name of the Course	:	**Internet Technologies Laboratory**
Learning level	:	**Higher-level Course**
Credits	:	**4**
Contact Hours	:	**8 Hours per week**
Total Marks	:	**100**
End Semester Marks	:	**70 (Pass Marks: 28)**
Internal Marks	:	**30 (Pass Marks: 12)**

End Semester Exam Time	:	**3 hours**

Course Objectives: *The course objective is to*
1. *Introduce working principle of email*
2. *Provide conceptual knowledge about GoogleMeet, ZOOM*
3. *Provide practical knowledge of web pages and sites development using HTML*

Following are some programming tasks for laboratory programming assignments but the assignments are not limited to these only.

1. Demonstrate E-Mail working (Sending ,Receiving, forward).
2. How to create, organize meeting in Zoom/ GoogleMeet.
3. Create a form by using various attributes of the input tags (text box, multiline textbox, option button, check box).
4. Create a simple HTML page by using some of the basic tags (hyperlink, marquee, image). 5. Create a web page with multiple types of style sheet used in a single page.
5. Write a CGI sample program to send output back to the user.
6. Create Time-Table using table tag.
7. Creation of Frames in browser window using HTML.
8. Write a java script program to create dialogue boxes using alert, confirm and prompt methods.
9. Write a java script program on Form Validations.
10. Write a java script program to perform four arithmetic operations: Addition, Subtraction, Multiplication and Division on two numbers. 12. Create a web site of our College.

Course outcomes: *After successful completion of the course, the students will be able to*
1. *Learn the basic working scheme of the Email, GoogleMeet, Zoom etc.*
2. *Understand fundamental tools and technologies for web design.*
3. *Design static web pages and sites using HTML.*

Syllabi of B. Voc. (Information Technology) SEC Courses

Semester	:	**V**
Course Type	:	**SEC**
Course Code	:	**BVIT-SEC-301**
Name of the Course	:	**Internship with Industry/ Community Engagement/Field Study**
Learning level	:	**Higher-level Course**
Credits	:	**2**
Contact Hours	:	**4 Hours per week**
Total Marks	:	**50**
End Semester Marks	:	**35 (Pass Marks: 14)**
Internal Marks	:	**15 (Pass Marks: 6)**
End Semester Exam Time	:	**2 hours**